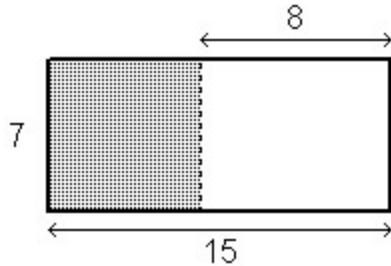Name: _____ Class: _____ Date: _____

Unit 09 PC Form A

1. ✏️ **Use pencil and paper to answer the question.**
   Write 2 number sentences for finding the area of the shaded part of the rectangle.

   Sentence 1: (_____ − _____) $*$ _____ = 49

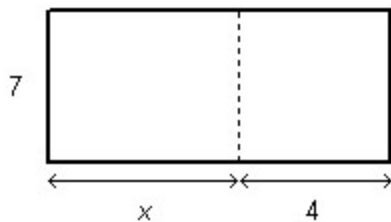   Sentence 2: (_____ $*$ _____) − (_____ $*$ _____) = 49

   ANSWER: Sentence 1: $(15 − 8) * 7 = 49$
   Sentence 2: $(7 * 15) − (7 * 8) = 49$

2. ✏️ **Use pencil and paper to answer the question.**
   The area of the rectangle shown below is 91 units^2.

   a. Write a number sentence that you can use to find the value of *x*.
   Number sentence: _____

   b. Solve for *x*. Show your work.
   x = _____ units

   ANSWER: **a.** $7(x + 4) = 91$
   b. 9 units

Unit 09 PC Form A

3. ▭ **Use pencil and paper to answer the question.**
   Solve each equation. Show your work.

   a. $9b - 6 = 24 + 14b$ **b.** $6 - 2t = 54 + 4t$

   Solution _____   Solution _____

   ANSWER:

   a. $b = -6$ **b.** $t = -8$

4. ▭ **Use pencil and paper to answer the question.**
   One formula for converting between Celsius and Fahrenheit temperatures is $F = (1.8 * C) + 32$.
   Convert the following:
   a. 75°C = _____°F

   b. 68°F = _____°C

   ANSWER: **a.** 167   (Setup:) $F = (1.8 * \mathbf{75}) + 32$
   b. 20   (Setup:) $\mathbf{68} = (1.8 * C) + 32$

5. The Sixth Grade Pep Squad can use the formula $P = 2.45k - 55$ to determine the profit earned on
   the sale of school keychains. Which formula is equivalent to $P = 2.45k - 55$?

   a. $55P = 2.45k$ b. $\dfrac{P}{55} = 2.45k$
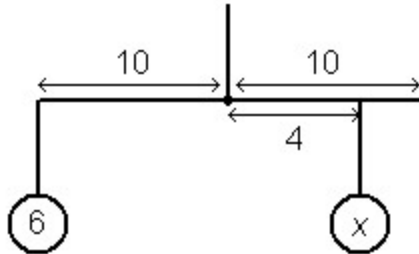
   c. $P - 55 = 2.45k$ d. $P + 55 = 2.45k$

   ANSWER: d

Unit 09 PC Form A

6. The mobile shown below is in balance.
The fulcrum of the mobile is the center point of the rod.

Formula:
$(W * D) = (w * d)$

What is the weight of the object to the right of the fulcrum?
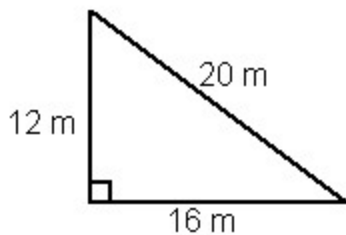
_____ units

ANSWER: 15

Unit 09 PC Form A

7. ▭ **Use pencil and paper to answer the question.**
   Use the formulas given to solve the problems below. Record the formula you use to solve each problem.

Area	
Parallelogram	$A = b * h$
Triangle	$A = \frac{1}{2} * b * h$
Circle	$A = \pi * r^2$

Use 3.14 for π. Round answers to the nearest hundredth.

a.
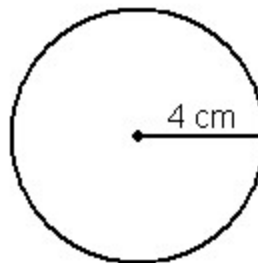

20 m
12 m
16 m

Area =_____
(unit)

Formula _____

b.

4 cm

Area =_____
(unit)

Formula _____

ANSWER:

a. Area = 96 m^2

$A = \frac{1}{2} * b * h$

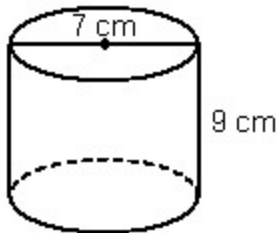**b.** Area = 50.24 cm^2

$A = \pi * r^2$

Unit 09 PC Form A

8. ▭ **Use pencil and paper to answer the question.**

Use the formulas given to solve the problem below.
Use 3.14 for π. Round answers to the nearest hundredth.

Record the formula you use to solve the problem.

Volume	
Rectangular prism	$V = B * h$
Cylinder	$V = B * h$
Sphere	$V = \frac{4}{3} * \pi * r^3$

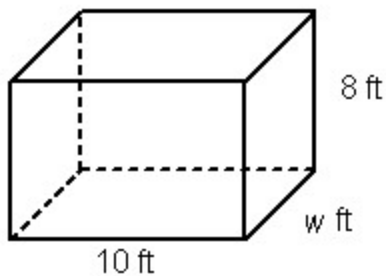Volume = _____
(unit)

Formula _____

ANSWER: 346.19 cm^3

$V = B * h$ (or $V = \pi * r^2 * h$)

Unit 09 PC Form A

9. 🖎 **Use pencil and paper to answer the question.**
Use the formulas given to solve the problem below.
Use 3.14 for π. Round answers to the nearest hundredth.
Record the formula you use to solve the problem.

Volume	
Rectangular prism	$V = B * h$
Cylinder	$V = B * h$
Sphere	$V = \dfrac{4}{3} * \pi * r^3$

8 ft

$V = 400 \text{ ft}^3$.
Find the width.
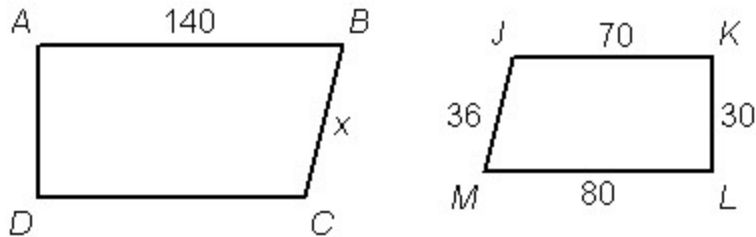
w ft

10 ft

$w=$ _____

Formula _____

ANSWER: 5 ft
$V = B * h$ (or $V = l * w * h$)

Unit 09 PC Form A

10. ▭ **Use pencil and paper to answer the question.**

Figures *ABCD* and *LMJK* are similar. Figure *ABCD* is an enlargement of *LMJK*.

a. The size-change factor that describes the enlargement is _____**X**.

b. Find the length of side *x*. _____

c. Calculate the perimeter of *LMJK*. Perimeter of *LMJK* _____ units

d. Explain how you can use the size-change factor to find the perimeter of *ABCD*.

_____

_____

_____

e. Calculate the perimeter of *ABCD*. Perimeter of *ABCD* is _____ units
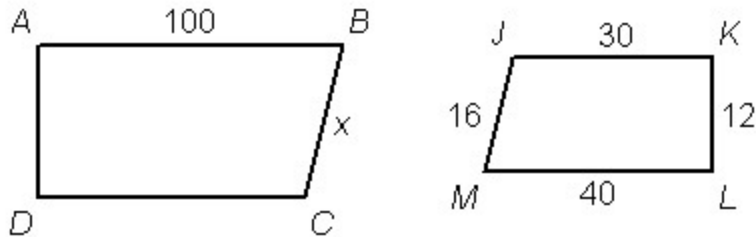
ANSWER: **a.** 1.75
b. 63
c. 216
d. Sample answer: Because *ABCD* and *LMJK* are similar, multiply the perimeter of
LMJK by the size-change factor of 1.75.
e. 378

Unit 09 PC Form A

11. ✏️ **Use pencil and paper to answer the question.**

Figures *ABCD* and *LMJK* are similar. Figure *ABCD* is an enlargement of *LMJK*.

a. The size-change factor that describes the enlargement is _____**X**.

b. Find the length of side *x*. _____

c. Calculate the perimeter of *LMJK*. Perimeter of *LMJK* _____ units

d. Explain how you can use the size-change factor to find the perimeter of *ABCD*.

_____

_____

_____

ANSWER: **a.** 2.5
   b. 40
   c. 98
   d. Sample answer: Because *ABCD* and *LMJK* are similar, multiply the perimeter of *LMJK* by the size-change factor of 2.5.

Unit 09 PC Form A

12. 🖎 **Use pencil and paper to answer the question.**
Solve the equation. Show your work.

$$3(z+5) = -9$$

z = _____

ANSWER: −8

Sample Work:

$$3(z+5) = -9$$
$$3z + 15 = -9$$
$$3z + 15 - 15 = -9 - 15$$
$$3z = -24$$
$$z = -8$$

Unit 09 PC Form A

13. ▭▶ **Use pencil and paper to answer the question.**
Solve the equation. Show your work.

$$6 = \frac{1}{2}(f - 9)$$

f = _____

ANSWER: 21

Sample work:

$$6 = \frac{1}{2}(f - 9)$$

$$2 * 6 = 2 * \frac{1}{2}(f - 9)$$

$$12 = 1 * (f - 9)$$

$$12 = f - 9$$

$$12 + 9 = f - 9 + 9$$

$$21 = f$$

Unit 09 PC Form A

14. ▭ **Use pencil and paper to answer the question.**

Using a trial-and-error-method, find an approximate solution to the equation $x^2 - 5 = 73$. Record your results in the table below. Use the suggested number to get started. Stop when your value for $x^2 - 5$ is within 1 of 73.

x	x^2	$x^2 - 5$	Compare $x^2 - 5$ to 73.
8	64	59	59 < 73

ANSWER: Sample answer:

x	x^2	$x^2 - 5$	Compare $x^2 - 5$ to 73.
8	64	59	59 < 73
8.5	72.25	67.25	67.25 < 73
8.7	75.69	70.69	70.69 < 73
8.8	77.44	72.44	72.44 < 73

15. There are 36 members on the school's track team. Five out of every 6 members were on the team last year. How many members were on the team?
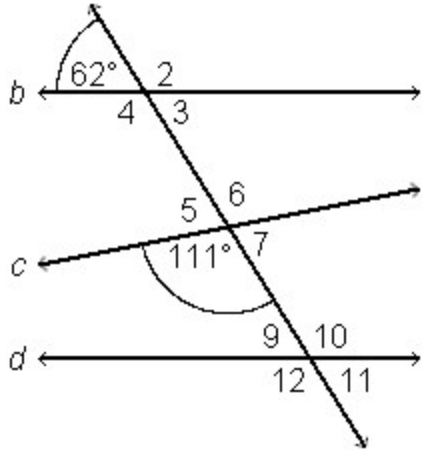
There were _____ members last year.

ANSWER: 30

Unit 09 PC Form A

16. ▭ **Use pencil and paper to answer the question.**
   a. Without using a protractor, find the measure of each numbered angle.
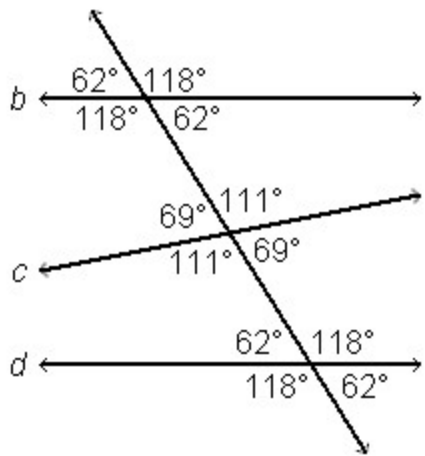   Lines *b* and *d* are parallel.

$m\angle 1 = 62°$	$m\angle 7 =$ _____
$m\angle 2 =$ _____	$m\angle 8 = 111°$
$m\angle 3 =$ _____	$m\angle 9 =$ _____
$m\angle 4 =$ _____	$m\angle 10 =$ _____
$m\angle 5 =$ _____	$m\angle 11 =$ _____
$m\angle 6 =$ _____	$m\angle 12 =$ _____

   b. List all angles in the figure above that measure 118°. _____

   c. List all angles that measure 69°. _____

   ANSWER:

      a. 2, 4, 10, 12
      b. 5 and 7

Unit 09 PC Form A

17. Use order of operations to evaluate the expression.

$10 - 15 * 2 - 11$ _____

ANSWER: −31

18. Use order of operations to evaluate the expression.

$-126 \div (12 + 6) + 2^4$ _____

ANSWER: 9

19. Which equation describes the relationship between the numbers in the table below?

x	y
$\frac{1}{2}$	−6
$\frac{3}{4}$	−7.5
−17	99
−3	15

a. $y = 6x - 3$ b. $y = \frac{1}{2}x + 3$ c. $y = -3x - 6$ d. $y = -6x - 3$
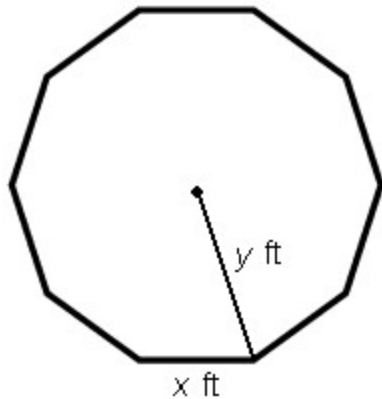
ANSWER: d

20. ✏ **Use pencil and paper to answer the question.**

Area of a Decagon

Explain how you would find the area of a regular decagon with sides measuring *x* feet each. Your explanation should be detailed, clear, and easy to follow. Be sure to include formulas in your explanation.

Unit 09 PC Form A

ANSWER: Answers vary. Sample answer: Divide the decagon into 10 congruent isosceles triangles. The line that defines the height of $\triangle AOB$ divides the triangle into 2 equal parts: right triangle **OCA** and right triangle **OCB**.
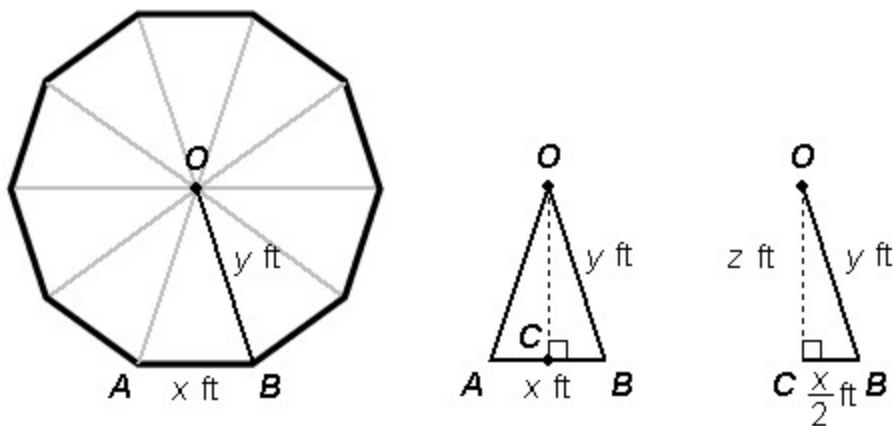
I know the length of the hypotenuse of the right $\triangle OCB$ is y ft.

One of the legs is $\frac{x}{2}$ ft. Let z represent the length of the other leg.

Using the Pythagorean Theorem: $\left(\frac{x}{2}\right)^2 + z^2 = y^2 . \left(CB^2 + OC^2 = OB^2\right)$

So, $z = \sqrt{y^2 - \left(\frac{x}{2}\right)^2}$.

The height of $\triangle AOB = z = \sqrt{y^2 - \left(\frac{x}{2}\right)^2}$ ft.

The area of $\triangle AOB = \frac{1}{2} * x * \sqrt{y^2 - \left(\frac{x}{2}\right)^2}$

Unit 09 PC Form A

(Area = $\frac{1}{2}$ * base * height).

So, to find the area of the decagon, I multiplied that area of $\triangle AOB$ by 10. (There are 10 congruent triangles in the decagon.)

The area of the decagon is $5x * \sqrt{y^2 - \left(\frac{x}{2}\right)^2}$ square feet.